23/11

Exercise I

1a) Define a chemical reaction.

ans. Any chemical change in matter which involves transformation into one or more substances with entirely different properties is called a chemical reaction.

b) What happens during a chemical reaction?

ans. A chemical reaction involves breaking of chem chemical bonds between the atoms or group of atoms of reacting substances and rearrangement of atoms making new bonds to form new substances with absorption or release of energy normally in the form of heat and light.

c) What do you understand by a chemical bon

ns. A chemical bond is an ~~acctract~~ attractive force that ~~holdes~~ holds the atom of a molecule together in a compound.

d) Give one example each that illustrates the following characteristics of a chemical reaction:

a) evolution of gas

ans. $Zn + H_2SO_4 \longrightarrow ZnSO_4 + H_2$

b) change of colour

ans. $Fe + CuSO_4(aq) \longrightarrow FeSO_4 + Cu$

c) change of state

ans. $NH_3(g) + HCl(g) \longrightarrow NH_4Cl(s)$

3. How do the following help in bringing about a chemical change? Explain each with a suitable example.

a) Pressure

Some chemical reaction ~~take~~ ~~to~~ take places when the reactants are subjected to high pressure

$$N_2 + 3H_2 \underset{200\,atm}{\overset{450^\circ}{\rightleftharpoons}} 2NH_3$$

b) Light

Some chemical reaction can take place only in the presence of light.

$$6CO_2 + 6H_2O \xrightarrow[\text{chlorophyll}]{\text{sunlight}} C_6H_{12}O_6 + 6O_2$$

c) catalyst

Some chemical reactions need a catalyst to change the rate of the reaction, in case it is too slow or too fast

$$2KClO_3 \xrightarrow[300^\circ C]{MnO_2} 2KCl + 3O_2$$

d) heat

ans. Some chemical reactions takes place only in the presence of heat.

$$2Pb(NO_3)_2 \xrightarrow{\Delta} 2PbO + 4NO_2 + O_2$$

4a) Define to catalyst

ans. A catalyst is a chemical substance that either increases or decreases the rate of a chemical reaction without itself undergoing any chemical change during the reaction.

b) What are i) positive catalyst

ans. When a catalyst increases the rate of chemical reaction it is known as

a positive catalyst. Eg - Iron, MnO_2

ii) negative catalyst ?

ans. When a substance decreases the rate of chemical reaction, it is known as a negative catalyst. Eg - Phosphoric acid, Alcohol

c) Name three biochemical or catalysts found in the human body.

ans. Amylase, pepsin, lipase are three biochemical catalyst in human body.

5. What do you observe when

a) dilute sulphuric acid is added to granulated zinc?

ans. When dil. sulphuric acid is added to granulated zinc effervescence effervescence is observed.

b) a few pieces of iron are dropped in a blue solution of copper sulphate?

ans When few pieces of iron are dropped in a blue solution of copper sulphate a light green to, the blue colour

colour of the solution changes into light green colour and red coloured deposits are formed.

c. Silver nitrate is added to a solution of sodium chloride?

ans When silver nitrate is added to a solution of sodium chloride a curdy white precipitate is formed.

d. Ferrous sulphate solution is added to an aqueous solution of sodium Hydroxide?

ans - When sodium ferrous sulphate solution is added to an aqueous solution of sodium hydroxide a dirty green precipitate is formed.

e. Solid lead nitrate is heated?

ans When solid lead nitrate is heated yellow solid and reddish brown gas is evolved

f When dilute sulphuric acid is added to barium chloride solution

ans

PTO

ans: When dilute sulphuric acid is added to barium chloride solution, white precipitate is formed.